

## Toothbrush

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### Abstract of DE 3621815 (A1)

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The invention relates to a toothbrush with a handle, a brush stem and a brush head, the latter consisting of a carrier and, arranged at or on the latter, mechanically acting means for cleaning the teeth. The invention is characterised in that the brush head (2) has an elastic body (3) of foamed material as a means for cleaning the teeth.



The invention relates to a toothbrush with a handle, a brush handle and a brush head, whereby the latter exists of a carrier as well as to or on this arranged, mechanical acting agents to the cleaning of the teeth.

Toothbrushes of the mentioned type are well known and common, whereby the mechanical acting agents are to the cleaning of the teeth bristle tufts, which are in different number, arrangement and alignment on the carrier arranged.

Adverse one with these known toothbrushes is that the bristles with their ends hit only punctually the tooth surface and that thereby no effective flat cleaning is gewährleistet. An other disadvantage is the adaptability lacking to the tooth relief with its curvatures and depressions, whereby it can come on surface portions of the tooth surface to a insufficient cleaning. Aluminium other disadvantage is mentioned that the bristles for with the tooth flash inevitably along- arising the processing of the gums, laid out in its starch and elasticity for the cleaning of teeth, too pointed, to hard and too few flexible are. Thus the gums can become damaged in particular with thorough tooth flashes. With some toothbrushes, in particular such also in thrust direction of the brush oblique bristles posed, it can come with frequent intense tooth flashes even to the erosion of tooth hard substance in the region of the tooth necks. Finally it is to be still stated that due to the storage of moisture between the bristles there favourable conditions for the Vermehrung of bacteria etc. exist.

The object places itself to create a toothbrush that initially mentioned type which avoids the listed disadvantages and which on for teeth and gums careful way a thorough cleaning of the teeth possible. Further a toothbrush is to become the order provided with the invention, for whatever higher hygienic claims can be sufficient.

The solution of this object succeeds according to invention by a toothbrush to that initially mentioned type, with which the brush head exhibits a resilient foam material body as agent to the cleaning of the teeth.

A such foam material body offers a substantial better flat cleaning efficiency, since it adapts laminar over the tooth surface moved and due to its elasticity very good also to the curvatures of the tooth surface. Large punctual forces, as they particularly arise with brush heads with bristles at the teeth and at the gums, as well as their negative sequences become so complete avoided. An other advantage of the toothbrush according to invention consists of the fact that the foam material body exercises a sucking and a pumping action during the tooth flash, which for a good liquid circulation and thus a good evacuation solved dirt particle provides.

A particularly thorough cleaning of also heavy accessible interdental spaces becomes ensured by at least a moulding connected integral with the carrier or, which projects into the foam material body and whose height of small is as the height of the foam material body. This moulding ensures for the fact to make that with increased contact pressure of the brush head to the teeth the part of the foam material body sufficient deep w introduced lain above the moulding into the concerned interdental space around also there a mechanical cleaning with good thoroughness. With laminar flash on the tooth surface the moulding steps against it due to its smaller height and a reduced contact pressure into function-prefered does not exhibit the moulding the form of an upright standing circular cylinder with conical, frustoconical or rounded tip or the form of an angular column with pyramidal, pyramidenstumpfförmiger, wedge shaped or rounded tip. All these forms is common that they make an insertion possible of the over-located part of the foam material body into interdental spaces in effective manner. Further is provided that the moulding consists of a resilient material, whose elasticity is smaller than those the moulding surrounding Schaumstoffkörpern. Damit becomes an ensured that the moulding does not cause injuries at tooth or gums with eventual breaking through of the part of the foam material body located over it and that it exhibits on the other hand a strength sufficient for a sufficient introduction of the foam material body into interdental spaces.

An alternative organization possibility of the moulding consists of the fact that it is formed by a bristle tuft from a number of single bristles. It applies also here that with laminar flash of the mouldings, D. h. here the bristle tuft, inside the foam material body remains, while the bristle tuft moves to the cleaning of interdental spaces by increased contact pressure of the brush head over-located part of the foam material body and/desert also this passes through and contributes even to the cleaning.

To the increase of the cleaning effect with laminar flash the foam material body can exhibit a structured surface at least at its during the tooth flash the teeth of facing side. In order to give to the foam material body a stability sufficient for the arising stresses, without worsening its surface properties favourable for tooth and gums, this can exhibit a strength increased from its inertial-remote side to the carrier. This firmness increase can become problem-free already with the production of the foam material body set. In addition is preferred provided that during the tooth flash the teeth facing surface of the foam material body exhibits a rectangular, oval, elliptical or round outlining form.

To the improvement of the hygienic properties of the toothbrush the foam material body is convenient releasable connected with the carrier is. Thus the foam material body can become as throw-away item manufactured and used, which becomes daily or renewed with each tooth flash. Since the remainder of the toothbrush is re-used, the costs remain very small, because the foam material body actual only relative low costs caused. Preferred embodiments of a releasable connection of foam material body and carrier come out from the claims 10, 11 and 12.

Finally still the possibility exists with the toothbrush according to invention that the foam material body is provided with one at least for an unique tooth flash of sufficient amount of an essentially chemical acting tooth cleaning agent in more liquid, more pasty, more powdery or more fixed, soluble form. In connection with the one-way use of the foam material body this represents an other improvement of the hygienic ratios and in addition a substantial comfort increase. Additional one becomes from unawareness frequent a made under or overdosing of the tooth cleaning agent, generally toothpaste, for the advantage and use of the toothbrush user avoided.

With the invention thus a toothbrush becomes the order provided, which guarantees a cleaning of the teeth and interdental spaces more thorough opposite toothbrushes to the state of the art and which at the same time substantial more hygienic as well as more careful for teeth and gums is.

Preferred embodiments of the invention become in the following more near explained on the basis a drawing. The figs of the drawing show in detail:

Fig. 1 a toothbrush in accordance with invention in the longitudinal section,

Fig. 2 a foam material body as part of the toothbrush after Fig. 1 in side view,

Fig. 3 a first embodiment of a brush head as part of the toothbrush,

Fig. 4 a second embodiment of the brush head,

Fig. 5 a third embodiment of the brush head with a replaceable moulding,

Fig. 6a to 6c of three different replaceable mouldings and

Fig. 7 a toothbrush in accordance with invention in supervision from above.

Like the Fig. 1 of the drawing shows, essentially consists themselves the represented embodiment of the toothbrush according to invention 1 of a grasp 11, one to this subsequent

stem 12 and one with latter connected brush head 2. During the grasp 11 and the stem 12, how with conventional toothbrushes performed are, the brush head 2 exhibits in principle different design.

As from the representation apparent is, the brush head consists here 2 of a carrier 21, which is integral 12 manufactured with the stem, as well as a resilient foam material body 3 arranged on the carrier 21. This exhibits a structured top 32, which serves for the cleaning of the tooth surfaces. Inside the foam material body 3 is a central recess 33, in a which positive moulding 4 integral with the carrier 21 projects. The moulding 4 exhibits a conical form and has an height, which is somewhat smaller than the height of the foam material body 3. Thus still another part of the foam material body 3 remains also above the moulding 4.

To the determination of the foam material body exhibits 3 on the carrier 21 latter 24 folding frameworks 23 pivotable around an articulation. Between this folding framework 23 and the carrier 21 a circumferential, pre-assembled bar 31 at that is trapable the carrier 21 facing side of the foam material body 3.

The form of the foam material body 3 with its, circumferential bar 31 arranged at the underside 34 as well as the central recess 33 becomes particularly significant in in Fig. 2 represented side view. Also here again the structured top of the foam material body 3 is more recognizable. Further is apparent that the strength of the foam, which forms the foam material body 3 of the top increases 32 to the underside 34 steady. Thereby the foam material body 3 receives a sufficient strength required for a fixed seat on the carrier 21.

Fig. 3 shows the carrier 21 of the toothbrush 1 from Fig. 1 in side view, whereby is 12 partly still shown of the remainder of the toothbrush only the stem. Like the Fig. the carrier 21 at its shows, exhibits 3 the stem 12 facing end the articulation 24, around which the folding framework is more pivotable 23 between an horizontal closed position and a vertical open position. At their, which 24 opposite ends exhibit articulation the carrier 21 and the folding framework of 23 acting with one another locking means 22 and 22 min, which provide in closed position for a determination of the folding framework 23. Central on the carrier 21 again, the conical moulding 4 before-rising up upward is more recognizable.

A second possibility of the attachment of the foam material body 3 on the carrier 21 shows the Fig. 4. Here the carrier 21 exhibits from the top accessible, inwardly open, circumferential

groove 25. This serves 31 of the foam material body 3 for the receptacle of the circumferential bar, like it z. B. in Fig. 2 described is. Also with this embodiment of the carrier 21 central on this is the already described moulding 4 arranged.

Fig. an embodiment of the carrier 21 shows 5, 21 integral with which the moulding is not 4 with the carrier, but when separate part is by an opening 26 in the carrier 21 ago from downside in this inserted. Further the carrier is 21 in this representation so performed that it is suitable for drawing bottom bias a standing foam material body up in particular. Separate retaining means are here not erforderlich particularly the moulding 4 to a safe stop of the foam material body on the carrier 21 contribute here.

In the carrier after Fig. 5 used mouldings 4 is in the Fig. 6 A again as separate part shown. Here significant is more visible that the moulding 4 exhibits a cylindrical basic form with conical tapered tip 42 and possesses at its bottom end a circumferential, pre-assembled notice bar 41. This provides for the adherence to the proper height of the moulding 4 after putting into the carrier 21. Except as in Fig. , the moulding can exhibit 6 A shown 4 also different forms, about which two exemplarily in the Fig. 6 b and 6 C shown are. While the mouldings here in their bottom with the moulding in accordance with Fig. 6 A identical are, are the tip 42 with the moulding 4 after Fig. 6 b frustoconical performed and with the moulding 4 after Fig. 6 C rounded designed. Concerning this outside natural still other form variations can become made.

Fig. a glance from above to a toothbrush 1 according to the present invention finally shows 7. Again the grasp 11 as well as the stem 12 are also here more recognizable, whereby the latters the brush head 2 follows. This consists again of the carrier 21, as well as the foam material body 3 arranged on it. The layer of the moulding 4 within the foam material body 3 is shown by a broken line. At that the stem 12 facing side of the carrier 21 further the articulation 24 more recognizable for the folding framework 23 is.

In these Fig. the foam material body exhibits 7 an essentially rectangular outlining form with light rounded off corner regions. Except this form the foam material body knows 3 also different outlining forms, like z. B. an oval, elliptical or circular form exhibit. Also the moulding can be 4 - except like here shown - also more other forward or other to the rear on the carrier 21 arranged. Also it can be perhaps favourable to place in place of a single moulding 4 two or still more moulding on the carrier 21.

1. Toothbrush with a handle, a brush handle and a brush head, whereby the latter exists of a carrier as well as to or on this arranged, mechanical acting agents to the cleaning of the teeth, characterised in that the brush head (2) a resilient foam material body (3) as agent to the cleaning of the teeth exhibits.

2. Toothbrush according to claim 1, characterized moulding (4), connected integral, by at least one with the carrier (21) or, which into the foam material body (3) and whose height projects is a small as the height of the foam material body (3).

3. Zahnbürste after the claims 1 and 2, characterised in that of the mouldings (4) the form of an upright standing circular cylinder with conical, frustoconical or rounded tip (42) or the form of an angular column with pyramidal, pyramidenstumpfförmiger, wedge shaped or rounded tip (42) exhibits.

4. Toothbrush after the claims 2 and 3, characterised in that of the mouldings (4) of a resilient material consists, its elasticity is than those the moulding (4) smaller of the surrounding foam material body (3).

5. Toothbrush after the claims 2 to 4, characterised in that of the mouldings (4) by a bristle tuft from a number of single bristles formed is.

6. Zahnbürste after the claims 1 to 5, characterised in that of the foam material bodies (3) a structured surface at least at its during the tooth flash the teeth of facing side (32) exhibits.

7. Toothbrush after the claims 1 to 6, characterised in that of the foam material bodies (3) one of its inertial-remote side (32) to the carrier (21) increased strength exhibits.

8. Toothbrush after the claims 1 to 7, characterised in that during the tooth flash the teeth facing surface (32) of the foam material body (3) a rectangular, oval, elliptical or round outlining form exhibits.

9. Toothbrush after the claims 1 to 8, characterised in that of the foam material bodies (3) releasable with the carrier (21) connected is.

10. toothbrush after the claims 1 to 9, ge thus marks that the carrier (21) a pivotable folding framework (23), lockable in closed position, and that the foam material body (3) at its exhibits exhibits the carrier (21) facing side (34) a circumferential, pre-assembled bar (31), which between the carrier (21) and the folding framework (23) is trapable.

11. Toothbrush after the claims 1 to 9, characterised in that of the carriers (21) at least, inwardly an open groove (25), accessible interiorlaterally circumferential around parts of its scope, from above, exhibits and that the foam material body (3) at its exhibits the carrier (21) facing side (34) one to the groove (25) compatible, pre-assembled bar (31), which to the support of the foam material body (3) on the carrier (21) into the groove (25) is importable.

12. Toothbrush after the claims 1 to 9, characterised in that of the foam material bodies (3) bottom resilient bias on the carrier (21) and/or on the moulding (4) is wind up.

13. Toothbrush after the claims 1 to 12, characterised in that of the foam material bodies (3) with one at least for an unique tooth flash of sufficient amount of an essentially chemical acting tooth cleaning agent in more liquid, more pasty, more powdery or more fixed, soluble form is provided.



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